EPA-ERT/SERAS

WORK LOCATION HEALTH AND SAFETY PLAN

Prepared by: Jon McBurney SERAS Approval: Patrick Mulrooney

DATE: June 10, 2011 .

1.0 INTRODUCTION

Site Name Cabo Rojo WA/TDD SERAS-130 .

Original Safety Plan: Yes X No Modification No. .

Location: Street No: Multiple Street Locations .

City: Cabo Rojo County: .

State: Puerto Rico Zip Code: 00623 .

Site Contact: Denise Zeno Site Phone #: 347-338-0137 .

Directions to Site: Sites are located throughout the city of Cabo Rojo and surrounding areas. .

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1.1 Site/Incident Description

A. Urban X Residential X Commercial X .

Industrial X Rural X Remote X .

Active X Inactive X Landfill .

Construction .

B. Spill Air Release Fire .

HW Site Other: Cabo Rojo municipal wells have been impacted .

by an unknown TCE source. Investigation is to find .

the source. .

C. Containers Involved? Yes No X .

Drums: None No. # Tanks No. # .

Describe condition: .

D. Site Size: City Wide Terrain: Varies Weather Hot .

E. Are Regional START's Onsite? Yes __ No X .

F. Map attached: Yes X No __.

1.2 Summary Site History: Cabo Rojo's public water supply has been impacted by an unknown PCE and TCE source. This source has forced the closure of several municipal wells, and is currently impacting at least one well. The EPA began investigating the Cabo Rojo area in 2006. It is now listed on the NPL list.

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1.3 Background Information Sources (Report Titles, Names, Dates)

__PRE-CERCLIS SCREENING REPORT

CABO ROJO SITE DISCOVERY INITIATIVE

CABO ROJO, PUERTO RICO

Pre-Cerclis Screening Report, Cabo Rojo Site Discovery Initiative, Cabo Rojo, PR; Region 2 Site Assessment Team, Weston Solutions; February 2007.

Hazard Risk Score Documentation Record, Weston Solutions, December 2010.

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1.4 Scope of Work

A.	Emergency Response __	Air Sampling __	Bioassessment __.
	Contractor Oversight X	Treatability Study__	Soil Gas Sampling X.
	Geophysical Monitoring __	Well Sampling X	Flux Chamber Sampling __.
	Well Installation __	Soil Sampling X	Tank Sampling __.
	Drum Sampling __	Bulk Sampling __.	
	Lagoon Sampling __	Sediment Sampling __.	
	Surface Water Sampling __	Walk Through Assessment __.	

B.

Task Description	Dates of Activity
1.Soil Gas Investigation	June 13 – June 17, 2011
2. Soil Sampling	June 13 – June 17, 2011
3. Groundwater Sampling	June 13 – June 17, 2011
4. Site Reconnaissance	June 13 – June 17, 2011
5. On-Site Analysis (Voyager)	June 13 – June 17, 2011

2.0 PERSONNEL

EPA Remedial Project Manager: Denise Zeno .

ERTC Work Assignment Manager/Site Supervisor: Jeff Catanzarita/George Prince .

SERAS Task Leader/Field Supervisor: Jon McBurney .

SERAS/START Site Safety Coordinator: Jon McBurney .

Subcontractor: (_None) GeoEnvirotech, Inc. .

Subcontractor Paperwork Necessary: _X_ Yes __ No If Yes, reviewed and approved: _X__ Yes

Field Personnel/Responsibility:

Scott Grossman - Sampling .

Amy Dubois - Sampling .

Rich Magan - Sampling .

Gerald Ball – Voyager GC Operation .

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3.0 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

3.1 Chemical Exposure Hazards

Inhalation	X	Ingestion	X	Skin Control	X
Biological	__	Explosive	__	Pressure Sensitive	__
Radioactive	__	Flammable	__	Water Reactive	__.

3.2 Physical Hazards

Heat	X	Scaffolds	__	Excavations/trenches	__.
Noise	X	Weights/Lifting	X	Underground Utilities	X .
Cold	__	Pressured Air	__	Compressed gases	X .
Boating	__	Overhead hazard	X	Unguarded floor opening/lagoons	__.
Ladders	__	Building entry	X	Heavy machinery	X .

Confined space (attach confined space entry plan) __.

Other: _____ .

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3.3 Tables in Section 3.3 on the following pages provide a summary of chemical, biological, and physical hazards that could potentially be encountered by personnel during each task.

TABLE 3.3.1

TASK RISK ANALYSIS: CHEMICAL and BIOLOGICAL HAZARDS of CONCERN

Task	Contaminant	Exposure Limits	Source Concentration Onsite	Route of Exposure	Symptoms of Acute Exposure	Monitoring Device (Response Factor)
1,2,3,5	Tetrachloro-ethylene (PCE)	PEL:100ppm-TWA PEL:200ppm-C PEL:300ppm (5min/3hr) TLV:25ppm-TWA TLV:100ppm-STEL IDLH:150ppm [Carcinogen] **Human Carcinogen:** **(Agency: Class)** NTP: Possible IARC: Possible	Groundwater/soil/ <10 mg/kg	Inhalation, ingestion, contact, absorption	Exposure to Tetrachloroethene may result in irritation of the eyes, nose and throat; nausea; flushed face and neck; vertigo; dizziness; incoordination; headache; drowsiness; skin redness; and long term liver damage. PCE affects the eyes, skin, respiratory system, liver, kidneys, and central nervous system and is associated with liver cancer in animal studies.	MultiRAE 10.6eV (0.57 vs. C4H8[IBE] of 1) (reading x 0.57= PCE)
1,2,3,5	Trichloro-ethylene (TCE)	PEL: 100 ppm - TWA PEL: 200 ppm - C TLV: 10 ppm TWA TLV: 25 ppm - STEL IDLH: 1000 ppm **Human Carcinogen:** **(Agency: Class)** EPA: Known IARC: Carcinogen NTP: Known ACGIH: Confirmed	groundwater/ soil/ <10 mg/kg	inhalation, ingestion, contact, absorption	Exposure to Trichloroethylene may result in irritation of the eyes and skin; headache; vertigo; visual disturbances; fatigue; giddiness; tremors; drowsiness; nausea; vomiting; dermatitis; arrhythmia heart beat; abnormal sensation (prickling); and long term liver damage. TCE affects the eyes, skin, respiratory system, heart, liver, and the central nervous system.	MultiRAE 10.6eV (0.54 vs C_4H_8[IBE] of 1)

1,2,3,5	1,2-Dichloroethene (1,2-DCE)	PEL: 200 ppm - TWA TLV 200 ppm TWA IDLH: 1000 ppm	groundwater/soil/ Unknown	inhalation, ingestion, contact, absorption	1,2-DCE can cause eye irritation, respiratory system, and depresses the response in the central nervous system (i.e., narcotic). 1,2-DCE affects the eyes, central nervous system, and respiratory system.	MultiRAE 10.6eV (Reading x 0.8 = cis-DCE]) (reading x 0.5 = trans-DCE)
1,2,3,5	Vinyl Chloride (VC)	PEL: 1 ppm -TWA TLV: 1 ppm – TWA IDLH: Not det. **Listed Human Carcinogen: (Agency: Class)** IARC: Carcinogen NTP: Known EPA: Known	breakdown products in soil and groundwater/ Unknown	Inhalation Ingestion Skin Contact	Exposure to VC may result in weakness; abdomen pain; gastrointestinal bleeding; enlarged liver; cyanosis of extremities; frostbite. VC affects the liver, central nervous system, blood, respiratory system and lymphatic system	MultiRAE 10.6eV (2.0 vs. C4H8[IBE] of 1) (reading x 2= VC)

Legend

ACGIH: American Conference of Governmental Industrial Hygienists
OSHA: Occupational Safety and Health Administration
TAGA: Trace Atmosphere Gas Analyzer
TWA: Time-weighted average
STEL: Short-term exposure limit
ppm: parts per million
mg/m^3: milligrams per cubic meter
Sd: Sediment; W: Water, S: Soil
PEL: Permissible Exposure Limit (8-hr Time Weighted Average airborne concentration enforced by the Occupational Safety and Health Administration, see 1910.1000, Final Rule, Tables Z-1, Z-2, and Z-3)
TLV: Threshold Limit Values (8-hr Time Weighted Average airborne concentration recommended by the American Conference of Governmental Industrial Hygienists (ACGIH), 2010 Threshold Limit Values for Chemical and Physical Agents and Biological Exposure Indices)
IDLH: Immediately Dangerous to Life and Health (Escape values designed to ensure that a "worker could escape without injury or irreversible health effects…in the event of failure of respiratory protection equipment")
NTP: National Toxicological Program (a group who evaluates and lists carcinogens)
IARC: International Agency for Research on Cancer (a group who evaluates and lists carcinogens)
N/A: Not applicable
MAGs-S: Military Air Guidelines – Short Term
OELs: Occupational Exposure Limits (Military)
CDC: Center for Disease Control
AEL: Airborne Exposure Limits (from CDC)
WPL: Worker Population Limit (8-hr TWA, an AEL value from CDC)
NL: Not Listed
MUC: Maximum Use Concentration (respirators)

TABLE 3.3.2
TASK RISK ANALYSIS: PHYSICAL HAZARDS OF CONCERN

PHYSICAL HAZARD	TASK	EXPOSURE CONTROL PROCEDURES
Noise	1,2,3	• All Lockheed Martin/SERAS personnel will participate in a Hearing Conservation Program (annual Audiometric Testing, etc). • All Lockheed Martin/SERAS personnel will attend annual training classes. • Hearing protection will be worn when working around heavy equipment such as the Geoprobe and Drill Rig; equipment such as the Little Beaver and Chainsaw; and appropriate powered hand tools. • Non-mandatory personnel will maintain clearance from excessive noise generating equipment. • Personnel will use the following rule of thumb to determine the need for hearing protection under other circumstances i.e. worn when normal conversation is not audible at a distance of 2 feet.
Heat (ambient)	1,2,3	• Prevention protocol and biological monitoring will be instituted at temperatures exceeding 70°F. • Physiological monitoring will be conducted in accordance with the attached Tables 3.3.4 and 3.3.5. • Work/Rest cycles will be instituted based on physiological monitoring. • Personnel should consume 16-ozs of water beginning work and at intervals (breaks, lunch) throughout the day. • Non-caffeinated liquids (water, electrolyte drinks, juice kept at 50-60 °F) will be maintained on-site throughout the work shift. • Signs of Heat Exhaustion and Stroke will be reviewed (attached); employees will monitor field team members for observance of these signs.
Rain	1,2,3	• May increase risk of hypothermia; see hazard preventions listed in the "Cold" Section of this Table. • Rain repellant outer gear should be worn by employees. An additional change of clothing should be maintained by for removal and replacement of wet clothing. • Rest breaks, shall be taken in a warm, sheltered area (van, trailer, nearby commercial space). • Work areas where water may accumulate and create additional slip/trip/fall hazards should be provided with drainage or barriers. • Employees should maintain an increased awareness of their physical surroundings, particularly when operating or when working around heavy equipment.
Electrical Storms	1,2,3	• At the first sign of lightning cease work, or if weather reports indicated a fast moving storm heading towards the worksite, seek enclosed shelter. Work will not resume outside until 30 minutes after the last sight of lightning.

All-Terrain Vehicles (ATV)	4	• Documented training is required prior to operation. Training will include reading the owner's manual, limits of use, and other information listed below: 1. A motorized or other sports helmet should be used if there is any chance of falling or flipping the vehicle. 2. Other safety equipment includes long pants, long shirt, over-ankle steel toe boots, safety glasses/goggles and gloves. 3. Do not ride on public/paved roads. ATVs are difficult to control on paved roads and were not designed to operate on these roads. 4. Never carry a passenger on a single rider vehicle. 5. Avoid steep inclines, particularly when travelling parallel to the hill crest. 6. Completely inspect vehicle before use including wheels, fluids, breaks, chains, etc.. 7. Operate at a safe speed and ride on designated trails.
Heavy Manual Lifting/Moving	1,2,3	• Inspect each object for presence of splinters, slivers, sharp edges, protruding parts, cracks, loose joints, and chemical/biological surface contamination. Eliminate or use P.P.E. to control contact accordingly. • Test weight of object; unless involved in weight training, recommended safe lifts for men and women are 50 and 35 pounds, respectively. If object weight exceeds the values listed above or the individual's personnel limits use mechanical lift equipment or assistance from a 2nd individual. • Inspect proposed path to ensure: obstructions removed from path, clearance appropriate for object dimensions, awareness of changes in grade and/or stairs/ladders, negotiable conditions of path surface. • When moving/lifting manhole covers use appropriate equipment, including specialized equipment (ie. Crowbars, etc). At least 2 people are needed for this work. Steel-toed boots are required. Pinch and struck by hazards are the biggest concerns. • Lift should progress as follows: 1. Place one foot slightly in front of the other. 2. Squat (knees bent) as close to object as possible. 3. Grasp one of the top corners away from the body, and the opposite corner closest to the body. 4. Tilt the object slightly away from the body, tilt torso forward at the hips, keep the back straight and tuck in the chin. 5. Test to ensure that object is loose from the floor and will lift without snagging. 6. Straighten the legs, keeping the backbone straight, pull the object into the body and stand up slowly and evenly without jerking or twisting. 7. If turning or a change in direction is required, turn with feet (not torso) and step in the direction of travel. 8. Reverse sequence when setting object on surface, being sure not to trap hands between object and surface.

Rough Terrain	1,2,3,4	• May include uneven surfaces, changes in grade, and excessive ground cover or vegetation. • This also increases risk for vehicle and foot passage. • Clear vegetation in heavy traffic (vehicle, foot) areas, where possible. • Mark excessively rough areas and minimize travel to and through such areas. • Plan equipment placement and activities accordingly. • Wear ankle high (or higher) steel-toe/shank work boots. • Discuss slip/trip fall hazards associated with daily tasks at pre-work job planning and safety meetings.
Housekeeping	1,2,3,5	• Provide adequate storage space for site equipment and supplies. • Assign time and responsibilities for daily clean-up prior to departure from site. • Ensure lunch areas are maintained free of empty bottles, containers, and paper. Provide trash receptacles with enclosed tops/covers in the designated lunch area and throughout site as necessary. • Do not accumulate flammable or combustible liquids on floors, walls, etc. Spills must be cleaned immediately. • Provide adequate lighting in and around all work areas, passageways, stairs and ladders. Keep all such areas clear of debris, supplies, and any other objects. • Mark and/or secure any object (extension cord)which must traverse a passageway. • Ensure that supplies are stored in neat stockpiles and that access aisles are created and kept clear of stored objects. • Remove combustible materials routinely, do not allow accumulation in areas where flammable and combustible materials are stored, handled, or processed.
Structural Integrity	1,2,3	• Hazard associated with deteriorating conditions of containers (drums, tanks) and buildings, scaffolding, and excavation or trenches. See Excavation/Trenching section for hazard prevention and controls associated with cave-in. • Demolition of any site structures requires the conduct and written documentation of an engineering survey. • Evaluate conditions of building or structure to be accessed for signs of instability; hanging loose or sagging material; water stains resulting in uncertainty of underlying support; cracking in concrete, masonry or plaster; buckled, rusted, or otherwise compromised eight bearing structural steel; protruding nails or fasteners; evidence of failure such as debris. • Delay entry into or onto structure of questionable integrity. Consult with Health and Safety Officer, to obtain experienced opinion. Other experts may need to be called in. • Ensure adequate spill contingency and containment materials are on-site prior to movement or work with questionable containers.

Remote Area	1-5	• May add or increase risks associated with conducting field tasks due to: difficult vehicular access, limited emergency services, heavy vegetation and undergrowth, and native wildlife. • Diligent adherence to prevention protocol identified for site hazards. • Where possible access roads and work areas should be undercut and cleared. • Ensure that proposed communications (i.e. cellular phone) is operable, and if not a back-up (public phones, or area where cellular phone is operable) is identified to field team members. • If accessing remote area of occupied site, identify final destination and return time to site personnel prior to departure.
Neighborhood	1-5	• Hazards associated with neighborhoods arise as a result of; socio-economic factors; client/resident relationship; client/labors relationship; physical design factors (lighting, secured barriers, remote location); value of equipment and materials; and benefits of sample tampering. • Ensure adequate site security provided for on-going activities. Site security may be provided by client, or may need to be contracted by SERAS personnel. Enforcement of security functions should be assigned to properly trained and authorized individuals. • Avoid verbal and physical confrontation. • Ensure SERAS personnel work in teams or groups where accessing and conducting activities in sensitive locations. Establish a communication procedure for obtaining on and off site assistance. • Provide adequate communication devices (mobile phones or radios) for teams working in sensitive locations. • Provide visible security precautions (fencing, "keep out" signs). Provide locked storage facilities on-site, construct adequate barriers for equipment or sampling devices which will remain unattended at off-site or unsecured site locations. • Use discretion of discussion related to site work when covering off-site off-hours.

Compressed Gases	5	• Hazards associated with compressed gas cylinders (>15psia at sea level) or piped systems. • Cylinders must be: closed, capped and secured during transport. If manually moved do not drag or slide containers or use a valve cover as a point of contact. • Obtain and use proper regulator for gas cylinder being used. Ensure valve and regulator are free of grease, oil, and other material prior to connecting one to the other. • A pressure manifold from a gas cylinder to a closed pressure system must contain a vent valve, a fill valve, and a relief device unless these features are integral parts of the pressure system. • Use a proper 2-stage regulator for efficiency and safety. • When opening cylinder or installing regulator stand to one side and look away from the regulator and gauge face; valve outlets should be pointed away from operator and other employees. • When installing regulator: turn delivery pressure adjusting "tee" counterclockwise until it turns freely; install the regulator on cylinder valve, open cylinder valve slowly until pressure registers on regulator; with flow control at outlet closed, turn "tee" until desired delivery pressure is read. • Cylinders should be stored in an area sheltered from environment and guarded from being struck by passing or falling objects. Cylinders should be secured during use, storage, and should be capped when not in use. • Special instructions are attached for gases including: oxygen, acetylene, chlorine, and flammable gases.
Vehicular Travel	1,2,3,4	• All drivers must be appropriately licensed when operating a vehicle. • All traffic rules and regulations, and all traffic control signs and devices should be followed. • Drivers of rental or unfamiliar vehicles should become familiar with all controls before operating the vehicle. • Drivers should operate vehicles defensively, exercise special care when operating on unfamiliar roads or during inclement weather, and should yield to pedestrians. • Trucks should be backed under the direction of a signal person when operator cannot view the rear area clearly. • Seat belts should be provided and used by each individual in the vehicle. • Personnel must not ride on the outside or back of vehicles. • Materials should be loaded within limits of vehicle weight capacity, should be secured, and should not protrude from rear of truck. • Personnel may not remain in or on vehicle being loaded by excavating equipment unless cab is adequately protected against impact. • Maintain road flares, fire extinguishers, first aid kits, and other safety equipment where necessary.

Traffic	1,2,3,4	• Hazards arise as a result of working adjacent to or within roadways. • Employees must wear reflective vests when working adjacent to or within roadways. • Advanced warning signs should be placed 1500ft in advance of condition to which they call attention. When in series, place first sign at 500ft, then additional signs 500-1000' intervals. On expressway and limited access facilities the advance warning distance should increase to ½ mile or greater. • Flag person may be required to control speed of oncoming traffic. • The Manual on Uniform Traffic Control Devices (MUTCD) put out by the US DOT's Federal Highway Administration should be used.
Heavy Equipment Operation SUBCONTRACTOR	1,2,3	• Machinery and mechanized equipment will only be operated by a competent qualified individual. • Equipment will be inspected daily; tests will be made at the start of each shift to ensure that the braking and operating systems are in proper working condition. • Seats and seatbelts will be available for and in use by all operators and passengers. • Stationary machinery and equipment will be placed on a firm foundation and secured (outriggers) prior to operation. • Mechanized equipment will be shut down prior to and during fueling operations. • Communication will be maintained with operator prior to approaching and while working adjacent to all heavy equipment. Communication between operator and ground personnel will be conducted using either radios or hand signals. Communication methods shall be determined prior to beginning work activities. • Barriers or blockades will be placed around the bodies of articulating equipment. • Individuals will not walk or otherwise travel beneath a load (bucket, etc.). • Hard hats shall be worn when working adjacent to heavy equipment.
Materials Handling	5	• Spill absorbent materials, patching materials, collection containers, and tools will be maintained on-site during activities which may impact the integrity of an enclosed storage system (i.e., sampling, product transfer, container movement).
Fire Extinguishers SUBCONTRACTOR	1,2,3	• Mounted on each piece of heavy equipment (Geoprobe, backhoe) • Inspected daily by SHSC (documented) to ensure proper access, within annual inspection requirement, physically intact, properly rated for applicable fire hazard class

Utilities SUBCONTRACTOR to provide Utility Clearance using subsurface geophysical techniques.	1,2,3	• Hazards include both overhead and underground utilities which may be impacted when conducting intrusive activities (i.e. Geoprobe sampling, drilling). Impact may result in the release of electrical energy, high pressure water, high pressure air/steam, natural gas, or sewage • The SERAS SHSC is the responsible on-site individual and must ensure that each of the following are addressed: 1. Locate and mark all underground utilities through inspection and identification by the appropriate utility representative 2. Assume all lines are live until shut-off is verified by an appropriate utility representative. Do not assume that abandonment of a facility/site has resulted in the shut-off of a utility supply 3. Inspect buildings adjacent to area of planned activity to identify cues which indicate the potential for underground and aboveground utility service (i.e. natural gas valves, underground tunnels, water valves or metering pits, compressed air or gas lines) 4. In the event that a utility representative will not mark utilities within the site fence line, identify the utility feed location and observe visual cues identified above. Intrusive work must be conducted in a slow and delicate manner, especially during the first 3-4 feet (depth at which most utilities will be located) 5. Maintain a 20 ft clearance between any live utility lines and elevated work platforms, ladders, scaffolds, man-lifts, and drill or vehicle super-structures until shut-off or insulation blanketing is required (if job duration exceeds one day, and is always required if 20ft clearance cannot be maintained)
Electrical	1,2,3,5	• When high voltage electrical service is required for site or project activities, service shall be connected by certified electricians in accordance with all applicable local and National Electric Codes • Ground fault circuit interrupters shall be used in the absence of properly grounded circuitry or when portable tools must be used around wet areas • Electrical lines, cables, and extensions cords must be appropriately guarded and maintained in good condition • De-energization and Lock-out/Tag-out procedure must be followed prior to commencing work on any piece of electrically active equipment or electrical line.
Hand Tools	1,2,3	• Inspect hand tool for defects that will impair their strength or render them unsafe (unsafe hand tools will not be utilized). Maintain them in good repair, and only use tools for their intended purpose
Power Tools	1,2,3	• Inspect power tool for defects that will impair their strength or render them unsafe (unsafe power tools will not be utilized) • Inspect power cord or battery and casing (electrical) or gas lines and related components to ensure there is no chance of a spark, electrocution, or explosion • Do not override any safety features of components on power equipment • Maintain tools in good repair. Use designated components as required. Do not "jury rig" tools to get them to work outside of manufacturer's specifications • Use tools only for their designed purpose • Read and follow manufacturer's directions when using all power tools

Uneven Terrain	1,2,3,4	• May include uneven surfaces and/or changes in grade • Wear ankle high (or higher) steel-toe/shank work boots • Discuss slip/trip/fall hazards associated with daily tasks at pre-work job planning and safety meetings
Biological (insect, tick, poisonous, plants)	1,2,3,4	• Hazards include: bites from snakes; infected wild animals; rodents; insects; ticks; and contact with poisonous plants • Snakes: use care when reaching into or moving objects, be familiar with habits of snakes indigenous to area, wear ankle high or higher steel-toe/shank boots, clear grass/overgrown areas if possible • Wild animals: avoid contact with wild/stray animals; be wary of nocturnal animals seen during the day, eliminate food sources and nesting sites, store trash/garbage in metal/thick plastic-lidded containers, cut grass/underbrush where possible • Insects: be aware of insect born disease outbreaks in area of travel, and utilize insect repellant as well as long sleeves/pants • Ticks: same as those for insects; tuck pant leg into socks and boots, conduct tick checks during breaks and at the end of the shift, wear light colored clothing, remove and save tick immediately • Plants: wear long sleeves/pants, use barrier creams if highly sensitive, do not contact plants which resemble poison ivy (3-leaves, rounded leaf) or sumac (paired leaves, white fruit) • Blood Borne Pathogen hazards and controls are identified in Lockheed Martin's Exposure Control Plan, training is conducted annually

TABLE 3.3.3

TEMPERATURE EXTREMES: SIGNS OF EXCESSIVE EXPOSURE

Temperature Extremes	Sign/Symptoms of Excessive Exposure
Heat Exhaustion	State of weakness or exhaustion caused by the loss of fluids from the body: pale, clammy, moist skin; profuse perspiration and extreme weakness; body temperature may be normal; weak/rapid pulse; shallow breath. **Treatment**: Remove individual to cool, air conditioned, or temperature controlled area; loosen clothing; place in head-low position; provide rest. Have patient drink 1-2 cups of water immediately, and every 20 minutes until symptoms subside.
Heat Stroke	Acute, dangerous reaction to heat stress caused by failure of body's heat regulating mechanisms resulting in a rapid rise in body temperature; brain damage; death; red hot dry skin; confusion; extremely high body temperature; rapid recovery and pulse rate; unconsciousness or coma. **Treatment**: Remove from heat source and cool victim rapidly by soaking victim in cool (not cold) water; sponge body with cool water to reduce temperature to safe level (<102F); monitor vital signs, and obtain immediate medical help.
Heat Cramps	Acute painful spasms of voluntary muscles caused by inadequate electrolyte intake, muscle spasms, most notably the abdomen and extremities. **Treatment**: remove victim to cool area and loosen clothing.
Cold-Frostbite	Local freezing of tissue resulting when heat loss from an extremity is faster than heat replacement by circulating blood. Frost bit occurs in stages; incipient (sudden blanching or whitening of skin); superficial (waxy or white skin which is firm to the touch, underlying tissue is resilient); and deep (cold, pale or darkened skin which is solid). **Treatment**: Move individual to warm environment, warm affected area by placing it next to warm skin (avoid hot water, external heaters), and provide warm non-caffeinated drinks. After re-warming affected areas evaluate, bandage (if necessary) and do not allow blisters to be broken. Do not rub frostbitten area, and obtain medical care as necessary.
Cold-Hypothermia	Occurs when a heat loss in excess of heat gain results in a core body temperature drop. Most cases develop in air temperatures between 30-50F when compounded with water immersion in soaking and windy conditions. Symptoms include: uncontrolled fits of shivering; vague' slow slurred speech,; stumbling, lurching gait; apathy, listlessness, sleepiness, glassy stare; slow pulse and respiration. Treatment: Move individual to warm environment, remove any wet clothing, provide additional heat sources (warm blanket, bath, body contact); provide warm non-caffeinated fluids, candy and sweetened fluids, candy and sweetened food, obtain medical assistance.

TABLE 3.3.4

PERCENT SUNSHINE FACTORS HEAT STRESS PREVENTION AND MONITORING		
Percent Sunshine (%)*	Sunshine Factor	Adjusted Temperature Calculation@
100	1	Air Temp + 13(1) = **Adjusted Temp**
50	0.5	Air Temp + 13(0.5) = **Adjusted Temp**
0	0	Air Temp + 13(0) = **Adjusted Temp**

*Linear Scale, any estimated percent sunshine divided by 100 will provide the corresponding Sunshine.
@Calculation: Air Temperature (in degrees F) + 13(Sunshine Factor) =Adjusted Temperature.

TABLE 3.3.5

PHYSIOLOGICAL MONITORING SCHEDULE HEAT STRESS PREVENTION AND MONITORING		
Adjusted Temperature (Table 3.3.4)	Monitoring Schedule **Level D** (Permeable Clothing)	Monitoring Schedule **Level C, B or A** (Impermeable Clothing)
90 °F or above	After each 45 minutes of work	After each 15 minutes of work
87.5°F-90°F	After each 60 minutes of work	After each 30 minutes of work
82.5°F-87.5°F	After each 90 minutes of work	After each 60 minutes of work
77.5°F-82.5°F	After each 120 minutes of work	After each 90 minutes of work
72.5°F-77.5°F	After each 150 minutes of work	After each 120 minutes of work

Physiological monitoring should include **oral temperatures** and/or **pulse rates**. Physiological monitoring should be conducted at the beginning of each rest period, the frequency of which is specified above.

Oral Temperature Criteria: An oral temperature in excess of 99.6 degrees Fahrenheit (or 1 degree above individual's baseline) will require that the next work period be reduced by 33%. This shall continue until the body temperature is maintained below 99.6 degrees (or 1 degree above baseline).

Pulse Rate Criteria: Heart rate should be measured by the radial pulse for 30 seconds. If the heart rate exceeds 110 beats/minute at the beginning of the rest period the next work period should be reduced by 33%.

TABLE 3.3.6
STORAGE AND USE REQUIREMENTS FOR SPECIFIC COMPRESSED GASES

Gas	Storage/Handling Requirements
Oxygen	• Maintain containers, valves, regulators, hoses and other apparatus free of oil and grease. • Store containers at least 20ft from a flammable gas container or combustible material • Separate from stored acetylene container by 20ft distance or 5ft barrier rated at 1hr fire protection.
Acetylene	• Isolate from open flame, sources of heat and combustible material • Do not use at greater than 15psig • Never use unalloyed copper pipe or fitting on acetylene system. A fitting with greater than 65% copper can react forming explosive, shock sensitive acetyl ides. • Always store and use cylinders in upright positions.
Flammable Gases	• Isolate from solvents, combustible material, electrical connections, and all sources of ignition. • Ground all manifolds • Store at least 20ft from oxygen cylinder.
Toxic Gases	• Use gases in forced ventilation areas or hoods with ventilation to outside • Read appropriate MSDSs prior to use • Wear approved respiratory protection when necessary

4.0 PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA's 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all site personnel will be trained in accordance with the requirements. At a minimum, all personnel will be trained to recognize the hazards on-site, the provisions of this SHSP, and personnel responsible for safety at this site.

1.1 Site Specific Training Topics

The following topics will be discussed by the SERAS field team leader prior to commencement of onsite activities:

_X_ Site Hazards _X_ Emergency Procedures _X_ (Tables in Section 3.3)

Other: _____.

5.0 PERSONNEL PROTECTIVE EQUIPMENT

5.1 Protective Ensemble

Tasks: _____	Tasks: _____	Tasks: 1,2,3,4 .
Level B __	Level C __	Level D X .
__ Barricade	__ Barricade	__ Barricade
__ Saranex	__ Saranex	__ Saranex
__ Tyvek	__ Tyvek	__ Tyvek
__ Other: __	___ Other: _____	X Other: Ear Plugs (as needed) .
__ SCBA	___ APR	X Eye Protection
__ Tetherline	___Cartridge: _____	__ Booties
__ Booties	___Booties	X Hard Hat ()
__ Surgicals	__ Surgicals	X Surgicals
__ Gloves: __	__ Gloves: __	X Work Gloves: As needed .
__ Overgloves: __	__ Overgloves: _____	__ Escape Pack
__ Hard Hat	___ Hard Hat (same)	X Steel Toe/Shank Boots
__ Steel Toe/Shank Boots	__ Steel Toe/Shank Boots	

Additional Protective Clothing:

X Rain Gear (as needed)	__ Hard Hat Liner	__ Splash Apron
__ Fireman Boots	__ Insulated Coveralls	__ Splash Shield

5.2 Justify levels of protection selected:

Levels of contaminant are expected to be very low. Vapor space will be monitored with MultiRae. For any concentrations above the action level the area will be evaluated. Work will cease until engineering controls such as ventilation, dust suppression or other can be initiated. No Level C work is expected.

Cartridge Change-Out Schedule: Cartridges must be removed and replaced after 8 hours of use (continuous or total). Regardless of usage time, cartridges must be removed and discarded at the end of each work shift. MSA data for aromatic, aliphatic (saturated), unsaturated hydrocarbons, and cyclic saturated hydrocarbons were reviewed, the most conservative data was used to determine an appropriate change out schedule. **If an employee begins to experience signs/symptoms of exposure or detects an odor, leave the area, inspect face piece, replace cartridges** prior to return.

6.0 SITE AIR MONITORING PLAN

6.1 Instrument Calibration

Required Instrument		Calibration Date	Battery Check
X	MultiRAE Lamp 10.6eV	After 6/6/2011	Daily
__	TVA (FID)	_____	_____
__	CGI	_____	_____
__	RAE Sensors:	_____	
__	SPM: Type: ___	_____	_____
	___	_____	_____
	___	_____	_____
__	Oxygen Detector	_____	_____
__	RAM-Type _____	_____	_____
__	Gilian Pumps	_____	_____
__	Draeger Tube Type: ___	_____	_____
	___.		
__	Radiation Meter		
__	Radiation Monitoring Badge		
__	Other _____	_____	_____

6.2 Person(s) Responsible for Monitoring (X indicates competence test checkout):

X Jon McBurney

X Amy Dubois

X Scott Grossman

X Rich Magan

_____

_____

6.3 Type of Monitoring:

__	Survey/Characterization	__	Perimeter
X	Work Zone	X	Exposure/Breathing Zone

1.4 Objective of Monitoring: Exposure zone will be monitored to minimize exposure and to verify level of protection. Sample sites will be tested with MultiRae to screen vapors prior to analysis.

1.5 Action Levels: **MultiRAE** will be used to take breathing zone readings during **intrusive activities**. Any readings **greater than 1 ppm** above the background will require the area to be evaluated. Air concentrations will have to be **below ½ the TLV for the compounds listed per table 3.3.1** in order to continue without upgrading the level of protection. For work being conducted above the action level for the listed compounds or for other known non-listed compounds (see Table 6.6.5) an upgrade to Level C will be required to continue work. If any 'unknown' or chemical odors are detected that may be a health risk; the area must be evacuated, the work area must be re-assessed; and the steps must be discussed with the SERAS HSM prior to re-entry.

Table 6.5-General Action Limit Guidelines for Health and Safety Planning

Chemical/Physical Contaminant	Action Limit or Calculation		Action
Flammable/Explosive Atmosphere	Ambient Air – Confined Space 0 - 1% LEL 1 - 10% LEL > 10% LEL		Continue Investigation Continue monitoring, use extreme caution Evacuate immediate area, explosion hazard present
Oxygen	Ambient Air 19.5 - 25 % < 19.5% > 25%	Confined Space 19.5 - 23.5 % < 19.5 % > 23.5%	Continue Investigation, normal = 21% Investigate only in Level B Protection, Oxygen Deficient Evacuate immediate area, Oxygen Enriched/Fire Hazard
Radiation	3x Background - 1 mR/hr > 1mR/hr		Continue Investigation, consult H&S Manager (possible source) Evacuate immediate area, radiation source/hazard present. Re-enter only under advisement of H&S Manager.
Organic and Inorganic Gases and Vapors	**Calculation:** 1. (TLV or PEL) X (½) X (RF of Instrument) 2. (IDLH or MUC or Cartridge Rating) X (½) X (RF of Instrument)		Upgrade to Level C/B Protection as outlined in HASP Upgrade to Level B Protection as outlined in HASP
Particulates (Unknown Site Concentrations)	**Calculation:** 1. (TLV or PEL) X (½); use RAM/MiniRAM assume RF=1 2. (IDLH or MUC or Cartridge Rating) X (½); use RAM/Mini RAM assume RF = 1		Upgrade to Level C Protection as outlined in HASP Upgrade to Level B Protection as outlined in HASP
Particulate (Known Site Concentrations)	**Calculation:** 1. $\frac{(1x10^6)X(TLV\ or\ PEL)}{(Conc.\ In\ mg/kg)(2)}$ 2 $\frac{(1x10^6)X(IDLH\ or\ MUC\ or\ Cartridge\ Rating)}{(Conc.\ In\ mg/kg)(2)}$ **Note: Use RAM/MiniRAM, assume RF=1**		Upgrade to Level C Protection as outlined in HASP Upgrade to Level B Protection as outlined in HASP.

7.0 MEDICAL MONITORING

All personnel are expected to maintain a current status with respect to their employer's medical monitoring program. Lockheed Martin maintains an annual schedule of update medicals. Subcontractors will be expected to provide documentation of current medical clearance form.

8.0 SITE CONTROL

8.1 Buddy system is required for all site work involving levels of protection or potentially representing a risk to personnel.

8.2 Site communications plan:

_X_	Cell Phone	__	Air Horn
__	Whistle	__	Megaphone
_X_	Hand Signals:		

Signal	Definition
Hands clutching throat	Out of air/can't breath
Hands on top of head	Need assistance
Thumbs up	OK/I'm alright/I understand
Thumbs down	No/negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

8.3 Site Work Zones:

The Exclusion Zone is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the Exclusion Zone requires the use of personnel protective equipment.

The Contamination Reduction Zone is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. Activities to be conducted in this zone will require personal protection as defined in the decontamination plan.

The Support Zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is therefore not required.

Site work zone definition can be found:

__ Site map __ Sketch on reverse of this page _X_ Other(See Below)

Exclusion zones will be determined at the time of sampling and will be defined by the area immediately surrounding the point of sampling. Site personnel will clear the exclusion zone of unauthorized personnel prior to initiating sampling activities.

8.4 Nearest Medical Assistance

Directions and a map to the nearest medical assistance is attached to this plan.

The following on-site personnel have current certification on CPR and/or First Aid.

NAME	CPR EXPIRATION DATE	FIRST AID EXPIRATION DATE
Jon McBurney	02/14/13	11/05/11
Scott Grossman	5/27/13	3/18/12
Amy Dubois	1/29/12	11/5/11
Rich Magan	1/29/12	1/29/13

8.5 Standing Orders

Standing Orders for Exclusion Zone

- No smoking, eating, or drinking in this zone.
- No horse play.
- No matches or lighters in this zone.
- Check-in on entrance to this zone.
- Check-out on exit from this zone.
- Implement the communications system.
- Line of sight must be in position when appropriate.
- Wear the appropriate level of protection as defined in the SHSP.

Standing Orders for Contamination Reduction Zone

- No smoking, eating, or drinking in this zone.
- No horse play.
- No matches or lighters in this zone.
- Wear the appropriate level of protection

9.0 DECONTAMINATION PLAN

Describe decontamination sequence for each level of protection to be used on-site.

Level C		Level D
Step 1	Boot Cover and Glove Wash	Remove Surgicals
Step 2	Boot Cover and Glove Rinse	Wash hands and face
Step 3	Tape Removal	Shower ASAP
Step 4	Boot Cover Removal	
Step 5	Outer Glove Removal	
Step 6	Saranex/Boot Wash	
Step 7	Saranex/SCBA/Boot/Glove Rinse	
Step 8	Safety Boot Removal (if necessary)	
Step 9	Suit (TYVEK or other) removal	
Step 10	APR removal/disinfection	
Step 11	Inner glove (Surgicals) wash/rinse/removal	
Step 12	Hand and face wash	
Step 13	Shower ASAP	

Are personnel required to assist with decon? __Yes _X_No

If yes, what level of protection is required for those assisting?
(Circle one) B, C, D.
Describe disposition of wastes: containerized and left on site .

10.0 CONTINGENCY PLANNING

10.1 Identify location of the following during the site orientation.

_X_ First Aid Kit: Box Truck Eye Wash: .
__ Stretcher: _____ Emergency Shower: .
_X_ Fire Extinguisher: Geoprobe .
_X_ Cell Phone: One per sampling team .
__ Site Telephone: .
__ Two-Way Radios: .
_X_ Telephone Contact Lists: With HASP Box Truck .
_X_ Evacuation Routes: Will be determined and communicated when on-site .

10.2 Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel.

Organization	Contact	Telephone
Ambulance:	Cabo Rojo Ambulance Service	(787) 851-3128 or 911
Police:		(787) 343-2020 or 911
Fire:		911
State Police: Puerto Rico State Police		(787) 832-2020
Hospital #1:	Perea Hospital 15 Cll Dr. Basura Mayaguez, PR 00680	(787) 834-0101
Hospital #2:	Hospital de la Concepcion 41 Luna Street San German, PR 00683	(787) 892-1860
Poison Control Center		(800)-282-3171
Regional EPA:	Denise Zeno	(347)-338-0137
State Authority: Puerto Rico Environmental Quality Board (Mazaguez)		(787)378-9152
CHEMTREC		**(800) 424-9300**
TSCA HOTLINE		(202) 554-1404
RCRA HOTLINE		(800) 424-9346
CDC (DAY)		(404) 452-4100
NIGHT)		(404) 329-2888
BUREAU OF ALCOHOL, TOBACCO & FIREARMS		(800) 424-9555, (202) 566-7777
NATIONAL RESPONSE CENTER		**(800) 424-8802**
PESTICIDE INFORMATION SERVICE		(800) 858-7378
BUREAU OF EXPLOSIVES, A.A. RAILWAYS		(202) 639-2229
LOCKHEED SERAS OFFICE		(732) 321-4200
FEDERAL EXPRESS - HAZARDOUS MATERIAL INFO		(901) 922-1666
Dennis Miller, SERAS Program Manager		(732) 321-4272 (W) (732) 906-1799 (H) (609) 865-9307 (Cell)
Patrick Mulrooney, Health & Safety Manager		(732) 321-4203 (W) (609) 865-9321 (Cell) (908) 369-0093 (Home)

10.3 Medical Emergencies

Any person who becomes ill or injured in the exclusion zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket.) First aid should be administered while awaiting an ambulance or paramedics.

Any person being transported to a clinic or hospital for treatment should taken with them information on the chemical(s) they have been exposed to at the site. This information is included in Section 3.0 of this plan. Map with directions to the hospital can be found attached to the back of this document.

10.4 Fire or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the designated personnel will advise the fire commander of the location, nature, and identification of the hazardous materials onsite.

If it is safe to do so, site personnel may:

- Use firefighting equipment available onsite to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials which may contribute to the fire

10.5 Spill or Leaks

In the event of a spill or a leak, site personnel will:

- Inform their supervisor immediately;
- Locate the source of the spillage and stop the flow if it can be done safely; and,
- Begin containment and recovery of the spilled materials with sorbent (vermiculate, etc.).

11.0 CONFINED SPACE

_X_ No confined space entry anticipated.

__ Confined spaces may be encountered in the following locations/during completion of the following tasks

_____.

_____.

__ Attach confined space entry procedures.

12.0 ACKNOWLEDGMENT

I have read understood, and agreed with the information set forth in this Health and Safety Plan and will adhere to the protocols specified herein.

Work Assignment Mgr	Signature	Date
Task Leader/Field Supervisor	Signature	Date
EPA	Signature	Date
Site Safety Coordinator	Signature	Date
Field Team Member	Signature	Date
Field Team Member	Signature	Date
Field Team Member	Signature	Date
Field Team Member	Signature	Date
Field Team Member	Signature	Date

SUBCONTRACTORS:

Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date

SITE SAFETY COORDINATORS REPORT: Please return this page with a copy of the plan and acknowledgment form to the SERAS Health and Safety Manager, and if applicable, the ERTC/TAT RSO.

1.0 Site Name: _____.

W.A.#: TDD: _____.

2.0 Tasks Performed Dates of Activity

_____ _____.

_____ _____.

_____ _____.

_____ _____.

3.0 Future Activity? Yes __ No __ If yes, explain: _____.

_____.

_____.

1.0 Describe if there were any changes made to the protection program?_____.

_____.

_____.

5.0 Summarize Findings (be sure to discuss monitoring results)._____.

_____.

_____.

6.0 Was the Health and Safety plan adequate? Yes __ No __.

What changes can be made for future activities?

_____.

_____.

_____ _____.

Signature SERAS Health and Safety/ERTC-TAT RSO

APPENDIX A

14.0 DRILLING OPERATIONS

Drilling methods that may be employed in SERAS projects include air or mud rotary, air hammer, hollow-stem auger, and hydraulic-push (Geoprobe). All but the hydraulic-push methods are subcontracted to drilling vendors. Hydraulic-push methods may be subcontracted or may be employed using the SERAS 6620 DT Geoprobe.

14.1 The primary hazards associated with drilling operations are physical in nature: overhead and underground utilities; suspended weights; pressurized lines; mechanical pinch points, etc. In addition to the average degree of hazards associated with a drill rig, additional complications are often the result of wearing protective gear to guard against chemical contaminants (i.e., respirators, gloves, protective coveralls). A drilling subcontractor is usually required to submit a Health & Safety Plan specific to the operation of their equipment; however, the following guidelines apply to all drilling and hydraulic-push operations including subcontractor personnel.

- Utility clearances must be obtained prior to any excavation or drilling.
- No work shall be performed within 10 feet of an electrical overhead line. Double-check for overhead wires before raising the mast of the rig.
- Hard hats shall be worn at all times on the job. The only exceptions being, while in a building, or an enclosed truck cab, or car.
- There shall be no walking, standing, or crawling under a suspended load.
- No one shall operate or repair a piece of equipment or machinery unless:

  A. He/she is properly qualified to perform the work assigned.
  B. He/she has been authorized by SERAS HSO and is familiar with the operations and equipment.
  C. He/she has inspected the equipment and determined that it is in a safe operating condition.
  D. He/she has inspected all mechanical features including cables and deemed the machine to be safe.

- After necessary repairs are completed, all guards must be replaced prior to using equipment.
- The cleaning, oiling, greasing, adjusting and repair of machinery must not be done while the equipment is in operation unless necessary to check adjustments. Do not clean parts of engines with gasoline.
- Safety shoes are required at all times. Do not wear loose clothing that could get caught in operating machinery. Wear work gloves.
- All gasoline engines shall be inoperative (ignition off) while fueling.
- Smoking is prohibited while equipment is being fueled.

- A fire extinguisher shall be readily available. Other fire extinguishers shall be located in strategic locations. Fire extinguishers should be checked prior to site work. All drilling rigs must have a fire extinguisher attached in a prominent place.

- Only authorized (subcontractor) personnel shall repair electrical equipment. Consider all unknown wires to be hot

- Employees must be properly licensed to operate vehicles and equipment.

- Work areas shall be kept orderly.

- Careless or reckless actions, especially horseplay, of any kind, will not be tolerated on a job site.

- Use correct safety goggles when grinding, chipping, sand blasting, burning or welding, or on any other operation where goggles are needed. As a "bystander" do not look at the welding. Your eyes could receive a "flash burn". Never strike tempered steel with a hammer due to the potential for this type of steel chipping off and embedding in your eye or flesh.

- When riding in trucks, sit down. Do not ride on fenders or tailgates. Do not let arms, legs, or feet hang over end or sides of truck. Do not get on or jump off any vehicle while it is in motion.

- Do not try to lift or push objects that are too heavy for you. Learn to lift the proper way, by bending your knees not you back. Get help if necessary.

- All tools must be kept in good condition. Do not use tools with cracked or loose handles or mushroomed heads.

14.2 Use of ERT/SERAS 6620 DT Geoprobe

The following general guidelines apply to the operation and transport of the ERT/SERAS Geoprobe.

14.2.1 Hazards

- Pinch points - Geoprobe rod ends, auger joints, stacked rods or augers

- Rotating augers - loose clothing

- Low head clearance when working directly over hole beneath mast

- Overhead and underground utilities

- Back strain - auger or Geoprobe rod handling

- Use of cutting tools to open acetate core sleeves

- Accidentally engaging operating controls

14.2.2 General Operating Procedures

- One person will be assigned the responsibility of lead operator. The lead operator will be responsible for operating the rig and performing the daily checklist. One additional person will assist with handling Geoprobe rods. While auguring, an additional person is recommended for assisting with auger flights. In either case, a separate person will be required for collection of soil samples or logging cores.

- A safe zone will be established using banner guard or physical barriers to prevent unnecessary personnel from entering the work area.

- Operations and crew will be familiar with the operator's manual and will review the practical training on rig use.

- The rig and inspection logs will be maintained.

- Wear heavy gloves when handling Geoprobe rods or augers.
- Hearing protection must be worn.

- During auger flight connection, pinch potential will be controlled by keeping hands away from the joint (heavy gloves must be worn). Constant communication between lead operator and helper must be maintained.

14.2.3 Daily Maintenance Checklist

- Check all fluids

- Test "kill" switch

- Confirm mandatory underground utility clearances, double check for indications of utilities not reported by appropriate state clearing centers

- Before raising mast, look up for overhead obstructions.

- Review location of kill switch and fire extinguisher with entire crew.

- Maintain safe distance from all electrical power lines. Mandatory distance is 10 feet.

- Decontaminate entire rig prior to leaving site.

- Check that fire extinguisher is charged.

- Be familiar with all safety procedures in ERT/SERAS SOP #3012 - *SERAS Health and Safety Guidelines for Field Activities*, Section 3.7 and operating procedures as defined in the Geoprobe Systems *Geoprobe Direct Push Machine Owner's Manual.*

14.2.4 Maintenance of Geoprobe

- Regular inspection and maintenance will be performed by qualified personnel. A full check-out will be performed on a monthly basis and immediately following extensive use.
- The daily inspection checklist will be completed by the rig operator.

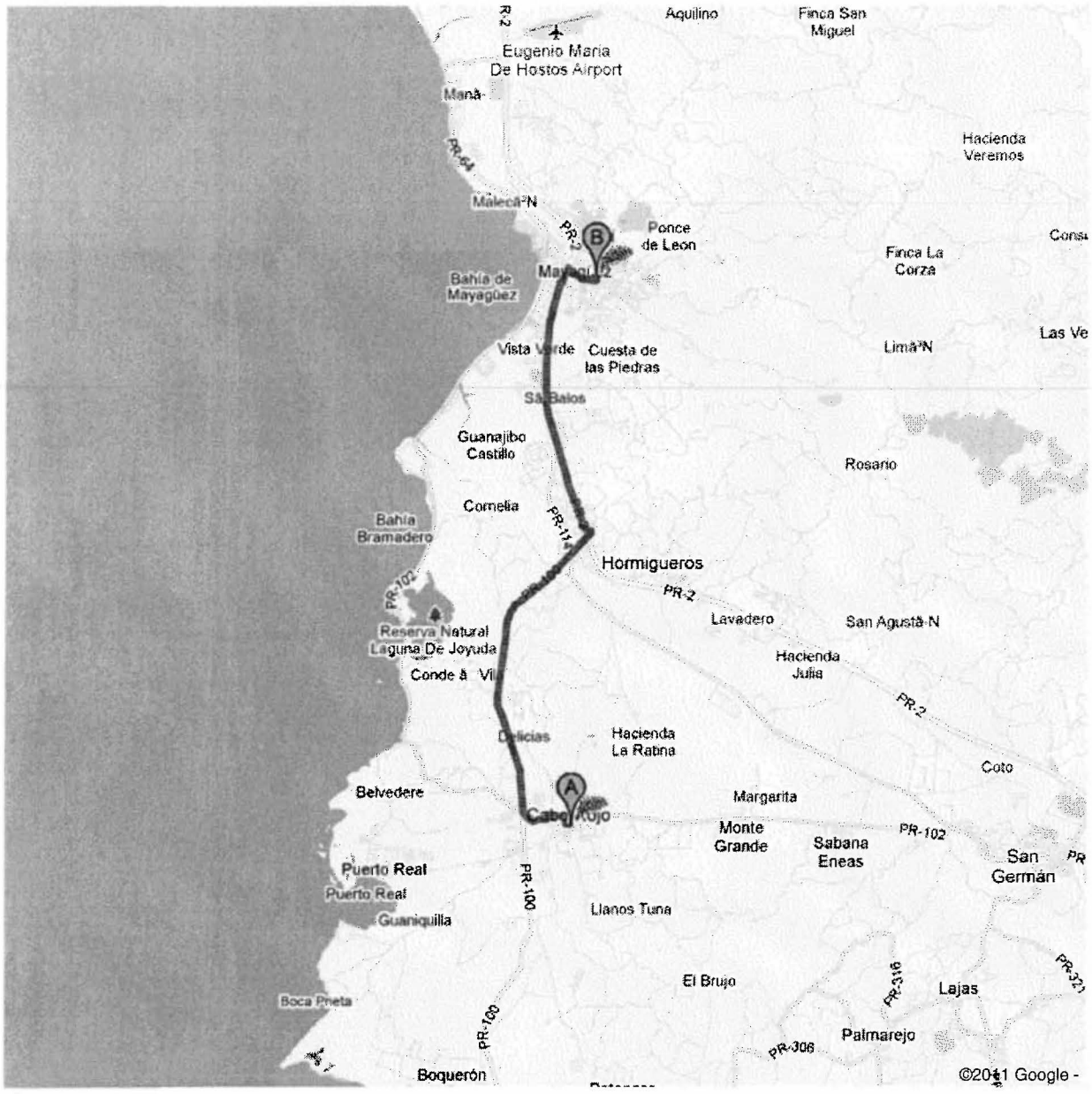
14.2.5 Towing

The Geoprobe is transported to work sites in a 14-foot long, 14,000 pound dual-axel trailer with electric brakes. The following general guidelines apply to transport of this equipment.

- Before towing, ensure that trailer support leg is "up" and secured.
- Ensure that hitch is positively latched and secure.
- Ensure the safety chains are loosely attached but not dragging
- Secure all loose equipment inside trailer
- Make sure door is secure and latched
- Check all brake, tail and signal lights
- Drive tow vehicle at safe speed; be aware of towing weight and stopping distance.

Google maps

Directions to Perea Hospital
15 Cll Dr Basora, Mayagüez 00680, Puerto Rico - (787) 834-0101
16.3 km – about **20 mins**



Cabo Rojo, Puerto Rico

	1. Head **west** on **Cll Ruiz Belvis** toward **Cll Barbosa**	go 83 m total 83 m
↱	2. Take the 1st right onto **Cll Barbosa**	go 180 m total 260 m
↰	3. Take the 2nd left onto **Cll Dr Nuevo Carbonell/PR-102/PR-103** Continue to follow PR-102 About 2 mins	go 1.2 km total 1.4 km
↗	4. Slight right onto **PR-100** About 8 mins	go 7.2 km total 8.6 km
↰	5. Keep left at the fork and merge onto **PR-2 N** About 6 mins	go 6.4 km total 15.1 km
↗	6. Take the exit toward **Calle McKinley Plaza**	go 350 m total 15.4 km
↱	7. Turn right onto **Calle McKinley Plaza** About 2 mins	go 750 m total 16.1 km
↰	8. Turn left onto **Cll Dr Basora** Destination will be on the right About 1 min	go 150 m total 16.3 km

Perea Hospital
15 Cll Dr Basora, Mayagüez 00680, Puerto Rico - (787) 834-0101